AFRD ISM Plan

Accelerator and Fusion Research Division
Ernest Orlando Lawrence Berkeley National Laboratory

Accelerator and Fusion Research Division
Integrated Safety Management Plan

Contents

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AFRD will conduct all of its operations in a manner that protects the health and safety of employees and the general public and that does not endanger the environment, as defined by the Laboratory's EH&S policies and requirements contained in the Regulations and Procedures Manual (RPM), PUB-3000, and the Berkeley Lab Integrated EH&S Management Plan (ISMS). This Plan has been established to assist in ensuring that the Division's ES&H objectives are met.

Accountability

The Division Director is responsible and accountable for assuring that all AFRD activities are carried out in a safe manner, in accordance with all Laboratory requirements.

The AFRD ES&H Coordinator oversees the Division ES&H program, including review of Activity Hazard Documents (AHDs).

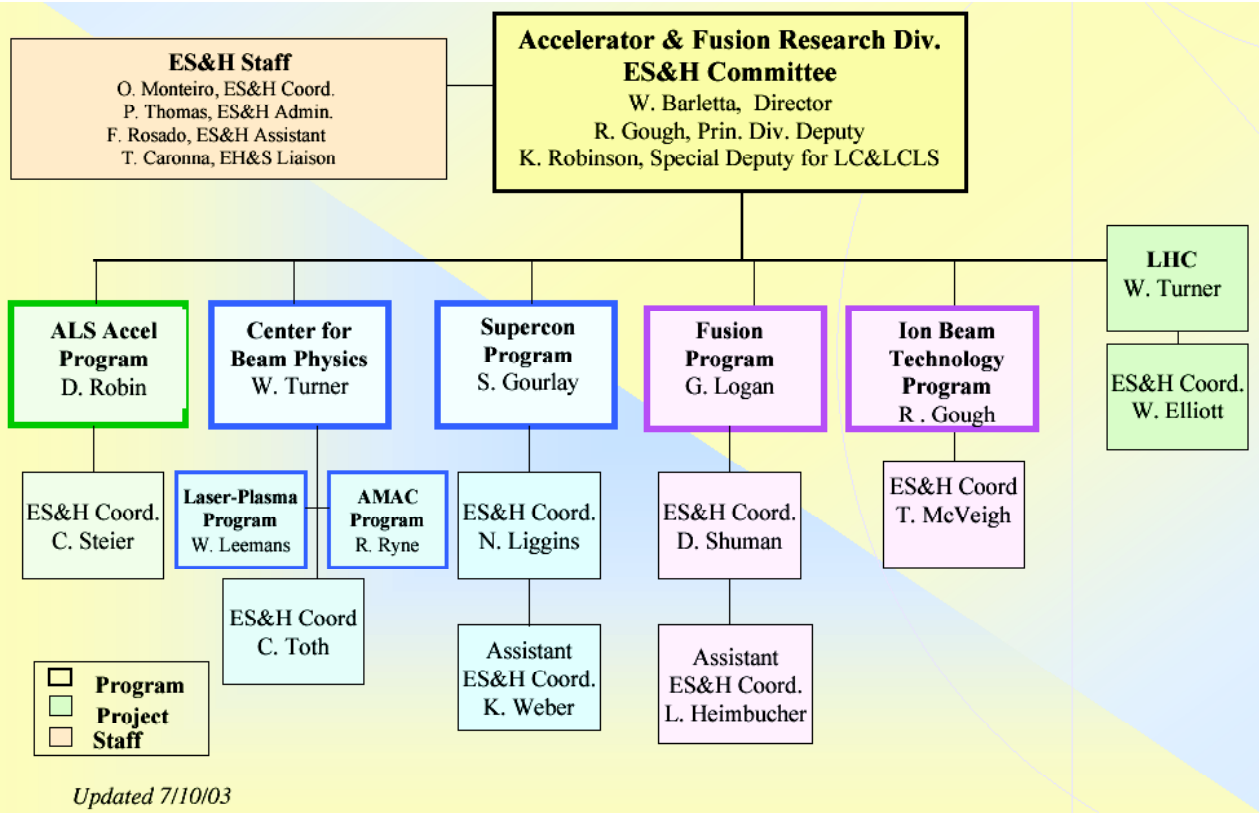
The AFRD ES&H Administrator is responsible for the day-to-day functioning of the ES&H program.

The structure and function of AFRD's safety organization is illustrated in Figure 1 and described in detail in Appendix 3, the QUEST Program Guide. The AFRD ES&H Committee is headed by the Division Director, and includes the Deputies, ES&H Coordinator, ES&H Administrator, Program Heads from each of the designated research programs, leaders of major projects, and Program/Project ES&H Coordinators. The AFRD ES&H Committee discusses ES&H problem areas and suggests improvements to the QUEST self-assessment program. The AFRD ES&H Operations Committee consists of the ES&H Coordinator, ES&H Administrator, and Program/Project ES&H Coordinators. The ES&H Operations Committee discusses ES&H concerns of the programs and projects, lessons learned from them, and information on lab-wide ES&H issues. AFRD ALS Accelerator Physics Program safety issues are coordinated through the ALS Division safety committee. The AFRD ES&H Administrator attends ALS Division safety committee meetings.

The EH&S Liaison is invited to the meetings of the AFRD ES&H Committee and Operations Committee. The EH&S Liaison provides technical support to AFRD operations and coordinates requests for additional EH&S services.

Figure 1, AFRD Environment, Safety, & Health Organization

(The organization chart is an attachment in the paper version of this document.
On the Web it may be obtained at
http://www-afrd.lbl.gov/ISM2003/AFRD_ES&H_OrgChart 2003.PDF
Shown here is a reduced partial version.)



Program Heads and Project Leaders are responsible for establishing, implementing, and maintaining effective ES&H procedures for their Programs/Projects and ensuring correction of ES&H deficiencies on a timely basis. All Program Heads and Project Leaders are expected to:

- Provide leadership and encourage participation in the ES&H activities of their Program/Project. Conduct at least one documented Program/Project all-hands meeting annually where safety is discussed;
- Conduct at least one documented safety walkthrough of their work spaces annually;
- Communicate regularly with their Program/Project ES&H Coordinator and maintain awareness of their Program/Project ES&H performance.

Each Program Head appoints one or more Program ES&H Coordinators. (The Laser Plasma Program and AMAC Program are represented by the Center for Beam Physics ES&H Coordinator.) In most Programs, this position is a part-time responsibility for a senior researcher or engineer. Projects appoint an ES&H Coordinator when significant fabrication and experimental work begins. (The LHC Project Leader has appointed a Project ES&H Coordinator. SNS is represented by Ion Beam Technology.) Program/Project ES&H Coordinators are expected to:

- Participate in AFRD ES&H Operations Committee activities;
- Inform the Committee of planned activities in their Program/Project and assist in hazard review and work authorization activities;
- Organize QUEST teams and report findings to the Committee;
- Report any accidents, occurrences, hazardous conditions, or concerns that require action and report completion of action items;
- Communicate relevant ES&H information to their Program Head, Project Leaders, and other affected personnel.

The Programs are further divided into Groups concentrating on certain areas of operations and/or research. Each Group is headed by a Group Leader who reports to the Program Head and is responsible for ensuring that work performed by members of the group is conducted in accordance with applicable ES&H programs, procedures, and requirements.

All supervisors (including Principal Investigators) are responsible for ensuring work is planned considering ES&H risks, all assigned personnel are trained in ES&H responsibilities appropriate to the tasks performed, and work is performed in accordance with all applicable ES&H work authorizations and requirements. All supervisors are expected to:

- Inform their Program/Project ES&H Coordinator of planned changes to work scope or hazards;
- Review hazards and controls, determine authorization requirements, prepare required documentation, and ensure authorizations are approved before beginning work;
- Exercise adequate ongoing oversight of work activities to maintain safe work conditions and practices. Conduct at least one documented safety walkthrough of work spaces annually. Report safety concerns to their Program/Project ES&H Coordinator;
- Maintain safe and orderly work areas, including identifying and removing unused equipment from active work areas to storage areas whenever practical;
- Provide a workplace safety orientation to newly assigned personnel;
- Evaluate the training needs of assigned personnel whenever their job hazards change. Evaluate employee ES&H performance during the annual Performance Review;
- Ensure any accidents involving assigned personnel, whether on-site or off-site during official travel, are promptly reported to LBNL Health Services;
- Participate in reviews of any accidents or occurrences involving assigned personnel. Ensure Supervisor's Accident Analysis Reports are completed promptly and accurately. Identify and perform appropriate corrective actions.

All AFRD personnel (including AFRD employees, matrixed employees, visitors, temporary employees, students, and participating guests) are assigned to a QUEST self-assessment team, with

the exception of short-term personnel. Persons whose participation in work activities at AFRD are anticipated to occur over a period of less than 90 days may be included in QUEST team as determined by the Program Head. ALS accelerator physics personnel are assigned to ALS Division QUEST Circles. Each QUEST team has charge of self-assessment for the workspace of it members.

All AFRD personnel are encouraged to report any workplace safety or environmental concerns to their supervisor. All accidents, on-site or off-site during official travel, must be reported to the supervisor and LBNL Health Services. All personnel are responsible for stopping any work activity considered an imminent danger, defined in Section 1.5 of Pub-3000 as any condition or practice that could reasonably be expected to cause death or serious injury, or environmental harm.

Contractors

Program Heads, Project Leaders, and supervisors (including Principal Investigators) take responsibility for the safety of contracted work by assuring qualified contractors are selected, hazards are identified, and work is performed safely.

AFRD contractor oversight will comply with the requirements of the ISMS. In accordance with Chapter 10 of PUB-3000, the safety rights and obligations of contract employees are the same as those of LBNL employees. AFRD supervisors assigned to direct the work of contract employees must provide instruction and conditions equivalent to those provided to LBNL employees, and require the use of equivalent safety equipment. (Equipment may be provided by LBNL or the contractor, as specified in the contract.)

Construction work must be authorized by LBNL Facilities. The safety and health of construction subcontractor employees is the responsibility of the construction subcontractor.

Matrix Personnel

A person is considered "matrix" if the person has a "home" division or department from which he/she is assigned exclusively to work in a "host" division or department which provides daily work instructions and oversight. Personnel from other divisions are matrixed to AFRD, and some AFRD personnel are matrixed to other divisions.

Persons performing short-term tasks for another division without being assigned a host supervisor, such as Facilities personnel responding to Work Requests or Engineering Division technicians working on AFRD equipment in the Bldg. 77 shop, are not considered matrix personnel. The safety of these workers remains the primary responsibility of the home division. AFRD personnel requesting work from another division are expected to inform the workers of any unusual hazards or safety precautions associated with the work.

Supervisors are always responsible for maintaining the safety of the workspaces under their control. All personnel are responsible for stopping any work activities they observe that appear to be an imminent danger, regardless of the status of the persons performing the work.

The safety of matrix personnel from other divisions working for AFRD is the responsibility of their host supervisor. The safety of AFRD personnel matrixed to other divisions remains the responsibility of AFRD unless otherwise specified in a Memorandum of Understanding established with the host division. Before work begins, the host supervisor, home division supervisor, and matrix person are to talk to each other about job hazards, ES&H training requirements, and performance expectations for the work to be done in the matrix assignment.

The Job Hazard Questionnaire or ES&H Training Profile for people who are matrixed to or from AFRD should be signed by the matrix person, the host supervisor, and the home division supervisor. The home division supports the matrix person's ES&H training as required by the JHQ. Host supervisors may require specific or unique training for matrix personnel assigned to their unit, and may provide on-the-job ES&H training specific to the assignment. The host division pays for any ES&H training the host supervisor requires matrixed personnel to complete for their assignment that is not required by their JHQ. Matrix personnel (as with all staff) must be supervised by a trained person until all training required for their assignment has been completed.

For engineering design work, it is the responsibility of the originating or approving engineer to ensure that design documents are processed in accordance with Engineering Division safety procedures.

Matrix personnel will participate in host division self-assessment activities as directed by the host division ISM Plans. The host division ES&H Coordinators and/or Administrator will invite the home division ES&H Coordinator and/or Administrator to participate in at least one joint walkthrough per year of workspaces of matrix personnel.

Occurrences related to matrix assignments are reported by the division whose operations are most affected, as determined by the host and home Division Directors. Home and host division personnel and EH&S Liaisons will assist in the Occurrence investigation, reporting, and corrective actions as requested by the reporting Division Director.

The home division supervisor retains primary responsibility for completing the Supervisors Accident Analysis Report for accidents involving their personnel who are matrixed to other divisions in accordance with the home division ISM Plan. Home and host division personnel and EH&S Liaisons will assist in accident investigation, reporting, and corrective actions as requested by the home division ES&H Coordinator/Administrator.

The host and home division supervisor discuss corrective actions for ES&H performance issues relative to the matrix assignment. The host supervisor refers matrix personnel to their home division supervisor to address issues that are not directly related to the day to day tasks of the matrix assignment. The host supervisor and home division supervisor stay appropriately informed of and sensitive to personnel issues that may be covered by collective bargaining agreements.

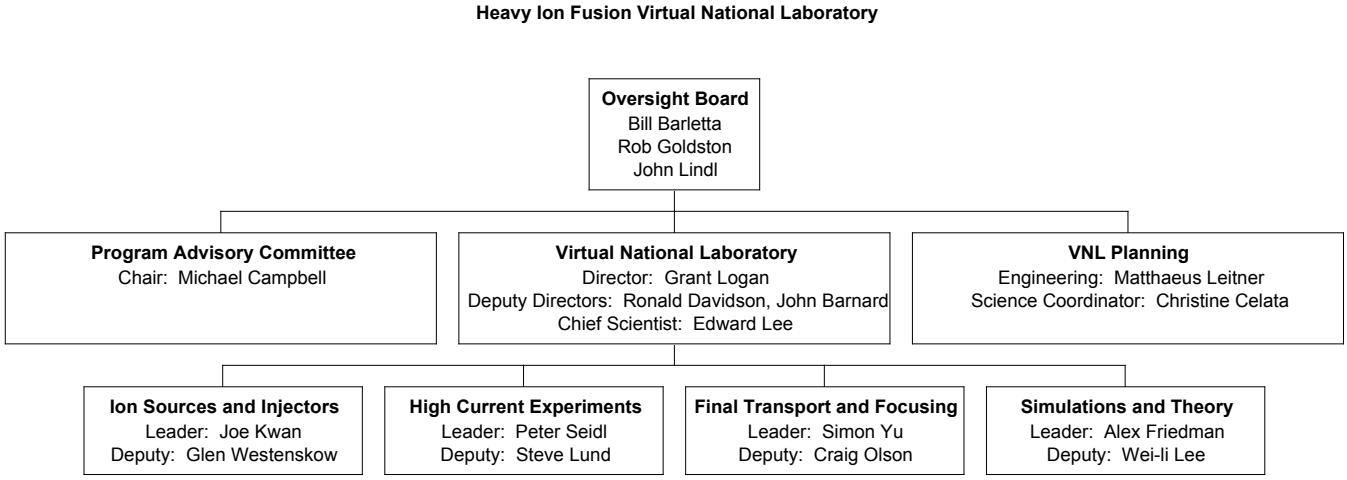
Heavy-Ion Fusion Virtual National Laboratory Safety Plan

Lawrence Livermore National Laboratory (LLNL), Princeton Plasma Physics Laboratory (PPPL), and Lawrence Berkeley National Laboratory (LBNL) are jointly engaged in Heavy Ion Fusion (HIF) research, with the goal of Inertial Fusion Energy based on heavy-ion induction accelerators as drivers. The staff of the three Laboratories carries out this research in a coordinated manner, as a Virtual National Laboratory (VNL). The terms of this coordination are outlined in a Memorandum of Agreement between the Laboratory directors. An Oversight Board governs the HIF VNL. The VNL Director provides strategic direction to the fusion energy science program and coordinates research efforts. The line management of each Laboratory retains supervisory authority of their personnel and responsibility for the safety of work at their home Laboratory. The VNL Deputies for PPPL and LLNL and the LBNL Fusion Energy Program Head keep the VNL Director informed about their Laboratory's management and ES&H organization structures.

As part of this coordinated research effort, many VNL staff members spend a fraction of their time at the three laboratories, and use the facilities of the three laboratories at least occasionally. The general principle to be followed by HIF VNL staff in all activities is to follow the operational procedures associated with the workplace where they are working at any given time. Integrated Safety Management principles are to be followed by HIF VNL staff wherever they are working, and by all personnel working at LLNL, PPPL, or LBNL. Office work at all three sites is to be carried out in a safe, responsible manner, with due regard to ergonomic safety considerations. Staff members are to be kept aware that their workplace environment will be adapted to meet their needs in this regard. (AFRD will provide ergonomic evaluations for HIF VNL personnel at LBNL in response to requests.)

Any safety concerns by HIF VNL personnel are to be communicated to the VNL Director and the Line Management where the concern occurs and the employee's home Laboratory.

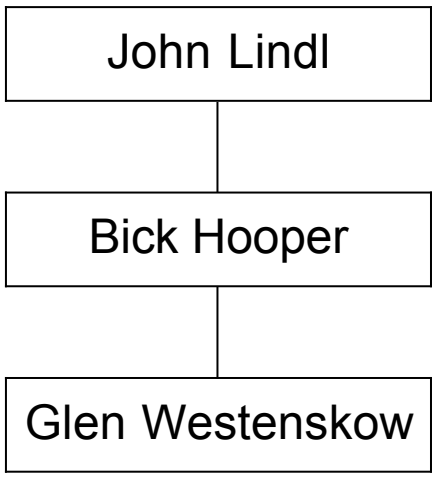
Figure A.



Work at LLNL

HIF VNL personnel working at LLNL must comply with the LLNL ES&H Manual (http://www.llnl.gov/es_and_h/esh-manual.html) and any Facility Safety Plan (FSP), Operational Safety Procedures (OSP) and other safety procedures that apply. Safety responsibilities at LLNL follow line management. For a VNL member working at LLNL, the first point of contact for safety concerns is the leader of the LLNL activity in which the individual is involved. ***NOTE: All injuries to LBNL employees at LLNL must be reported to LBNL Health Services (510-486-6266) and the employee's LBNL supervisor.***

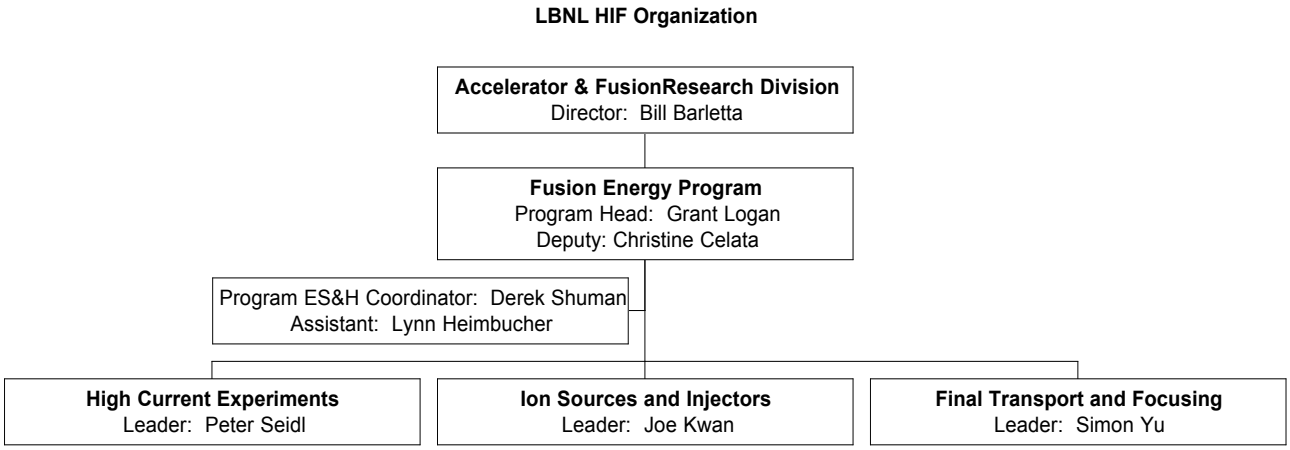
Figure B. LLNL HIF Organization



Work at LBNL

The Fusion Energy Program Head is responsible for the safety of VNL work at LBNL. The Fusion Energy Research Program Safety Coordinator assists the Program Head in implementing the safety program. LBNL and AFRD requirements, including PUB-3000 (http://www.lbl.gov/ehs/pub3000/) and the AFRD ISM Plan, govern all work at LBNL. Work procedures and authorizations are established for specific activities. Every person performing work at LBNL must be familiar with and implement applicable LBNL safety standards. Section 1.3.2 of PUB-3000 describes responsibilities for all personnel working at LBNL. These responsibilities include taking the initiative to seek assistance or advice as needed to carry out operations safely.

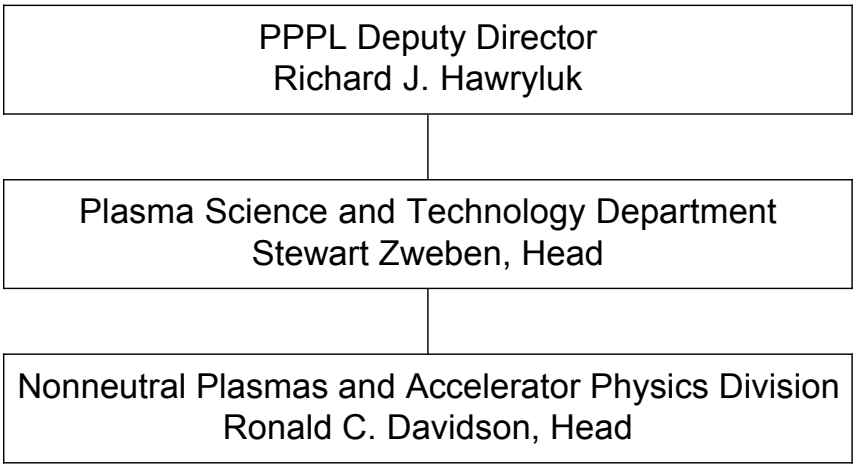
Figure C.



Work at PPPL

HIF VNL personnel working at PPPL must comply with the requirements described in the PPPL ES&H Manual (http://www.pppl.gov/eshis/ESHD_MANUAL/sm.html) and the PPPL Visitor Guide (http://www.pppl.gov/guide/), including completion of General Employee Training. In addition, HIF VNL personnel must follow requirements specified in project or facility specific documents such as Safety Assessment Documents (SADs) and operating procedures. All workers must be trained commensurate with their assignments to perform work safely. Safety responsibilities at PPPL follow line management. For a VNL member working at PPPL, the first point of contact for safety concerns is the leader of the PPPL activity in which the individual is involved. All individuals working at PPPL, including HIF VNL personnel, have the authority and responsibility to require that work, which is creating an imminent danger, be immediately stopped. ***NOTE: All injuries to LBNL employees at PPPL must be reported to LBNL Health Services (510-486-6266) and the employee's LBNL supervisor.***

Figure D. PPPL HIF Organization



Scope of Work

The scope of AFRD research activities is defined by the Mission Statement of our Division Charter: "The Accelerator and Fusion Research Division is broadly charged with conducting basic and applied research and development in all areas pertaining to the physics and technology of beams. In addition, it operates major LBNL facilities that exploit accelerated beams for use in basic and technological research." Divisional activities encompass the conception, design, construction, and operation of accelerators and storage rings for scientific and technological research, for fusion-energy experimentation, and for industrial and medical applications, as well as the development of superconducting magnets, beamlines, and other components for use in such machines. Current AFRD operations include particle beams, superconducting magnets, lasers, laboratories, machine shops, fabrication areas, warehouse space, and office spaces.

Some AFRD personnel conduct work at the Advanced Light Source, 88-Inch Accelerator, and other LBNL facilities. AFRD personnel may also work on the University of California campus and at other off-site locations. Personnel from other organizations, including visitors, guests, and students, work at AFRD facilities.

The hazards associated with operations at LBNL are described in the Hazards, Equipment, Authorizations and Review (HEAR) database. The HEAR database is one of the tools used by the division for defining its authorized scope of work and for identifying the hazards associated with its work activities. The database information is reviewed and updated at least annually by the AFRD ES&H Administrator. Program/Project ES&H Coordinators inform the Administrator of planned changes to work scope and associated hazards.

The AFRD ES&H Administrator also serves as the Division Space Coordinator. This combination of duties provides additional opportunities for participation in the work planning process, to ensure facilities provided are appropriate to the work to be performed in the space. Space coordination activities require the ES&H Administrator to visit work areas frequently, providing opportunities to observe work in progress and assist in identifying potential hazards.

Operations and Work Authorization

Division, Program, and Project managers and supervisors (including Principal Investigators) are responsible for considering ES&H hazards, risks, and concerns during the work planning process and appropriate controls are determined prior to authorizing work. AFRD work authorization procedures are tailored to the level of hazard of the work.

General duties not requiring formal authorization are authorized by the employee job descriptions and by completion of training requirements determined by the supervisor. Hazards for routine work are identified on the HEAR database.

Work recognized as posing special hazards is planned and authorized as described in Chapter 6 of PUB 3000, the ISMS, Section 1.3 of the Operating and Assurance Plan, and AFRD and Program/Project procedures. Work authorization methods commonly utilized for AFRD operations are described below.

Field Work Proposal/Agreements (FWP/As), Work For Others requests (WFOs), Cooperative Research and Development Agreements (CRADAs), and Laboratory Directed Research and Development (LDRD) documents are carefully reviewed for compliance with environment, health, and safety concerns. The conceptual design process includes documented involvement of applicable EH&S Division personnel in the review of performance and regulatory requirements, codes and standards, and ES&H criteria.

Major projects (according to DOE classification criteria) undergo a formal Operational Readiness Review (ORR) or Accelerator Readiness Review (ARR) under DOE direction. Smaller projects undergo an internal readiness review and work authorization process performed by program and division management as described below.

Experimental hazards are assessed and authorized in accordance with PUB-3000, Chapter 6, EH&S Documentation and Approvals. The HEAR Client Input Form (PUB-3000, Chapter 6, Appendix G) is used to document the review of experimental activities to determine authorization requirements.

For experiments or facilities that require an Activity Hazard Document (AHD), the AHD is reviewed and signed by the Division Director, AFRD ES&H Coordinator, the Principal Investigator, and appropriate EH&S Division representatives.

Work requiring a Radiological Work Authorization, Sealed Source Authorization, or other ES&H permit or authorization will be performed in accordance with the authorization issued by the EH&S Division.

AFRD personnel working off-site are required, at a minimum, to comply with the ES&H requirements applicable to the site at which they are working. The Principal Investigator/Activity Supervisor is responsible for assigned personnel working off-site, including the obligation to stop work immediately if they encounter or discover any work-related activities constituting an imminent danger.

Qualification

AFRD selects, assigns, and retains personnel in accordance with the RPM and AFRD procedures. In selecting from a group of applicants, the division director, program head, or project leader evaluates the applicants' qualifications and selects the person who possesses the qualifications to perform the duties of the position most effectively. In making this judgment, the division director, program head, or project leader compares the knowledge, skills, abilities, and other qualifications of the applicants with those required for successful performance of the duties of the position. AFRD contractor selection will comply with the requirements the RPM and ISMS. Effective and successful performance of duties includes performance in a manner that protects the health and safety of employees and the general public and that does not endanger the environment, as defined by the Laboratory's EH&S policies and requirements contained in the RPM, PUB-3000, ISMS, and OAP.

Training

Each AFRD supervisor is responsible for ensuring all assigned employees, students, visitors, and guests whose anticipated assignment with AFRD exceeds 60 days have completed an ES&H Training Profile within the first month of work. (The Training Profile is usually created by completing the Job Hazards Questionnaire. Supervisors may create Training Groups for their personnel.) Whenever an employee's job assignment changes, the ES&H Training Profile is reviewed to ensure that the required training is appropriate to the employee's job hazards, program assignments, and safety roles. Annually, in conjunction with the Performance Review process, the ES&H Training Profile and the employee's completion of required training is reviewed, and a training plan is developed for each employee for the next twelve-month period.

Work authorizations, such as Activity Hazard Documents, Radiological Work Authorizations, and Sealed Source Authorizations, may specify training requirements for authorized personnel. The AFRD ES&H Administrator ensures EH&S training courses required by AFRD work authorizations are included in the Training Profiles of authorized personnel. The training records of authorized personnel are reviewed for completion of required EH&S courses prior to approval, modification, and renewal of formal work authorizations. The Principal Investigator or Activity Supervisor designated by the work authorization is responsible for ensuring authorized personnel have completed required training, including on-the-job training in activity-specific procedures, before being allowed to work without direct supervision.

Funding of EH&S Requirements

Principal Investigators incorporate appropriate resource allocation for ES&H concerns in all research proposals, including cost of safety equipment, permits, training, maintenance, waste disposal, and facilities modifications unless covered by institutional funding sources.

Resources

To facilitate implementation and execution of the Division ES&H Program, the following Division resources are made available:

0.2 FTE Division ES&H Coordinator
1.0 FTE Division ES&H Administrator
0.1 FTE General Sciences ES&H Assistant

The AFRD ES&H Administrator's duties include providing approximately .12 FTE support to the ALS Division ES&H Coordinator.

ES&H efforts are integral part of all AFRD activities and are performed by all AFRD personnel as needed and appropriate to the job task. The estimated level of effort is anticipated to include, but is not limited to:

$\geq$ 4 hr/Program or Project/month Program or Project ES&H Coordinator duties
$\leq$ 1.5 hr/employee/month QUEST self-assessment team

AFRD will require support from EH&S Division professionals on an as-needed basis. EH&S estimates that direct support activities may require a level of effort of approximately .47 FTE, as described in Appendix 1, Estimated EHS Support of AFRD. AFRD also expects to receive EH&S general programmatic support as described in PUB-3000, including but not limited to EH&S training courses.

Validation, Feedback, and Improvement

AFRD's primary method of assessing and validating the effective implementation of this Plan is our self-assessment process, described in detail in Appendix 1, the QUEST Program Guide. Our self-assessment process is evaluated annually and findings are summarized in the annual AFRD Self-Assessment Report. Performance measurement criteria for this report are described in Appendix 2. Walkthrough and QUEST action items are tracked to completion on the LCATS database. Action item completion status, trends, and root causes are summarized in the AFRD Self-Assessment Report.

Additional opportunities for improvement will be identified through LBNL self-assessment activities, as described in PUB-5344, ES&H Self-Assessment Program, including Integrated Functional Appraisals, Integrated Hazard Assessments, Safety Review Committee MESH reviews, and Appendix F performance reports. If any discrepancies between authorization information provided by EH&S and records maintained by AFRD are noted, these discrepancies will be discussed with the appropriate EH&S personnel and the relevant documents will be corrected or clarified as necessary. DOE, UC, and ES&H regulatory agency oversight activities may identify necessary improvements. Applicable information from the LBNL Lessons Learned program will be disseminated by the ES&H Administrator as another means to share information for accident prevention and hazard awareness.

This Plan will be reviewed and updated annually, and may be revised more frequently as needed to facilitate compliance with regulatory and contract requirements and enhance the effectiveness of the Plan.

Accelerator and Fusion Research Division
Environment, Safety & Health Management Plan

Review and Approval

Signatures:

Submitted by

_____ _____
William A. Barletta, Director date signed
Accelerator and Fusion Research Division

EH&S Resource Commitment:

_____ _____
David C. McGraw, Director date signed
Environment, Safety & Health Division

Accepted:

not required for update; original plan signature on file

_____ _____
Charles V. Shank, Director date signed
E. O. Lawrence Berkeley National Laboratory

APPENDIX 1
Estimated EHS Support of AFRD
From the EH&S Division

Function	**FTE**
Division Liaison Function	
Liaison -- AHD Reviews	.05
Liaison -- Inspections (IFA, SA, etc.)	.10
Liaison -- Consultations, meetings, etc.	.05
	.20
Other EH&S Support	
Electrical safety	.02
IH Hazard evaluations (includes chemical issues, respirators, lead, noise, confined space, air quality, project support)	.10
Emergency coordination and management	.03
ORPS	.05
Waste -- Training, consultations	.05
	.25
Total	**.45**

Note: EH&S support of ALS is included in the ALS Division ISM Plan.

APPENDIX 2. AFRD PY 2003 Self-Assessment Performance Measures

1. Define Work

Lab Expectations (for annual SA Report)	**AFRD Actions** (to implement expectations)	**Evidence** (for OAA validation)
E1. Resources are effectively allocated to address ES&H, programmatic, and operational considerations.	E1.1 ES&H funding and resources are included in project proposals. E1.2 No projects are delayed due to inadequate planning for ES&H requirements. E1.3 Division or Program funding constraints does not impede corrective action completion.	E1.1 Copies of project proposals maintained in Division budget office. E1.2 Identify exceptions in Division Self-Assessment Report. E1.3 Identify exceptions in Division Self-Assessment Report.
E2. Line management regularly communicates ES&H policy, procedures, and lessons learned to all staff. Division has clear lines of communication to convey ES&H issues to Lab and Division management, including evidence of clear policy for all staff to communicate safety concerns. Examples of appropriate communications include: • Annual all-hands division meeting • Research procedures and protocols include safety notes, PPE requirements • Division-wide emails • Active Division Safety Committee • Group safety meetings • Division ES&H web site • Roles and responsibilities detailed in ISM plan	E2.1 Division Director sends annual safety memo to all Division employees. E2.2 AFRD ES&H Operations Committee meetings are held every month. Division management and each Program* are represented at each meeting. The Division ES&H Plan, its implementation status, and ES&H issues are discussed at these meetings. E2.3 AFRD ES&H Committee meetings are held at least 3 times/year. Division management and each Program* are represented at each meeting. The Division ES&H Plan, its implementation status, and ES&H issues are discussed at these meetings. E2.4 AFRD holds at least one annual "all-hands" meeting at which safety is discussed. E2.5 Each Program* holds at least one annual "all-hands" meeting with the Division Director and Program Head at which safety is discussed. E2.6 AFRD ISM Plan is posted on AFRD website. E2.7 Each Program* Head appoints a Program ES&H Coordinator to facilitate communication of E&HS issues and concerns between Program	E2.1 Copy of safety memo maintained in Division Office. E2.2 Copy of meeting agendas, minutes, and attendance sheets maintained in Division Office. E2.3 Copy of attendance sheets maintained in Division Office. E2.4 Copy of all-hands safety meeting agenda and attendance sheet maintained in Division Office. E2.5 Copies of Program all-hands safety meeting agendas and attendance sheets maintained in Program offices. E2.6 Website address. E2.7 AFRD ES&H Committee organization chart. E2.8/E2.9 Copy of signed and dated ISM Plan maintained in Division Office.

	staff and Division management. E2.8 The Division has an approved ISM Plan in place. E2.9 The Division ISM Plan is reviewed at least annually and updated as necessary.	

2. Identify Hazards

Lab Expectations (for annual SA Report)	**AFRD Actions** (to implement expectations)	**Evidence** (for OAA validation)
E3. Workspaces are inspected and evaluated on a regular basis.	E3.1 Division ES&H Administrator walks through all AFRD workspaces at least annually with appropriate Program ES&H Coordinator.	E3.1 % Division workspace inspected documented in Walkthrough records maintained in Division Office.
E4. Divisions have a process to identify, analyze, and categorize hazards associated with work. Examples of hazard inventory include: ❑ HEAR database. ❑ project safety review ❑ workspace safety review	E4.1 Principal Investigators or designated project participants complete AHDs or HEAR Client Input Forms for new experimental activities and modifications to experiments, which add new hazards or increase the level of hazards. Program ES&H Coordinator provides a copy to the Division ES&H Administrator. E4.2 Work not requiring formal EH&S authorizations is authorized by identification of hazards in the HEAR database and identification of appropriate training in Training Profiles. Hazards inventory for all AFRD workspaces is reviewed and updated annually. E4.3 For all projects requiring AHDs, Division review and approval will be obtained before project start-up. The Division will review AHDs for active projects annually or when changes in hazards or controls are anticipated. E4.4 Current Radiological Work Authorizations and Sealed Source Authorizations will be maintained for all projects requiring these authorizations.	E4.1 Current AHDs are on file in the Division Office and posted at the work area for all projects requiring AHDs. E4.2 Hazards inventory information is maintained on the HEAR database. Training profiles are maintained on the EH&S Training database. E4.3 A spreadsheet of AHD renewal dates and current status is maintained in the Division office. E4.4 Current Radiological Work Authorizations and Sealed Source Authorizations are on file in the Division Office and maintained at the work area for all projects requiring these authorizations.

3. Control Hazards

Lab Expectations (for annual SA Report)	**AFRD Actions** (to implement expectations)	**Evidence** (for OAA validation)
E5. Divisions ensure engineering and other safety controls are in place and maintained. Examples include, but are not limited to: • guards • fume hoods • interlocks • personal protective equipment • gas monitors.	E5.1 Line Management ensures lab and shop safety ventilation systems and required monitors under their control are checked, serviced, calibrated and/or certified as required by PUB-3000, work procedures and manufacturers' recommendations. E5.2 Where applicable, QUEST teams check engineering controls in their areas at least annually.	E5.1 Documentation of equipment inspection and servicing maintained in Program Office or at work site. E5.2 QUEST team assessment records/meeting notes maintained in Program Office.
E6. Divisions ensure administrative controls are in place and maintained. Examples of administrative controls for self-authorized work include: • work procedures • project safety reviews • assurance letters	E6.1 Line Management ensures administrative controls are in place and maintained.	E6 Documentation of administrative controls maintained at applicable work sites.
E7. Divisions ensure that ergonomic issues are effectively addresses for work processes and staff workstations.	E7.1 Line managers request ergonomic evaluations for personnel with ergonomic concerns. E7.2 Line managers provide funding for ergonomic equipment identified in ergonomic evaluations. E7.3 Division ES&H Administrator ensures ergonomics training is made available to Division personnel.	E7.1 Records of ergonomic evaluations maintained on EH&S ergonomics and training databases. E7.2 Purchase requisitions maintained in Division or Program offices; worksite verification. E7.3 Ergonomics training records maintained on EH&S Training database.

4. Perform Work

Lab Expectations (for annual SA Report)	**AFRD Actions** (to implement expectations)	**Evidence** (for OAA validation)
E8. Work is performed within the ES&H conditions and requirements specified by Lab policies and procedures.	E8.1 Supervisors identify hazards and take actions necessary to reduce the rate of accidents and occurrences. All personnel report accidents and occurrences as required by PUB-3000. E8.2 Hazardous waste generators assigned custodianship of Satellite Accumulation Areas (SAAs) maintain them in accordance with Guidelines for Generators, PUB-3092. Generators maintain control of SAAs, categorize and label wastes properly, and request pick-up by EH&S before accumulation time limits are exceeded. E8.3 Division and Principal Investigator/Activity Supervisor review training records of personnel when reviewing authorizations. Principal Investigators/ Activity Supervisors ensure personnel complete on-the-job training required by authorizations and maintain records of training.	E8.1 Accident reports (SAARs) maintained by EH&S and in Division Office. Accident statistics reported by EH&S. Occurrence Reports maintained by EH&S and in Division Office. E8.2 % compliance for SAAs determined by EH&S inspection; %QA waste samples and number of NCARs reported by EH&S waste management. E8.3 Training review memos maintained in AHD files. Records of on-the-job training maintained by PI or Activity Supervisor.
E9. Staff is proficient in performing work safely.	E9.1 Division ES&H Administrator reviews training needs with Programs at AFRD ES&H Operations Committee meetings. E9.2 Supervisors review Training Profiles and training records with employees during Performance Review period and when duties change significantly.	E9.1 Training profiles and completion rates maintained in LBNL database. E9.2 Copies of signed JHQs or Training Profiles maintained in General Sciences Human Resources Office or Program offices.
E10. Divisions review at least one research or operations process. Reviews are documented and, if possible, waste reduction strategies are implemented.	E10.1 ES&H Administrator and Generator Assistance Specialist review at least one process. E.10.2 Generators implement appropriate waste minimization efforts.	E.10.1 Report submitted to EH&S Waste Management. E10.2 Waste generation data maintained by EH&S.

5. Feedback and Improvement

Lab Expectations	**AFRD Actions**	**Evidence**

(for annual SA Report)	(to implement expectations)	(for OAA validation)
E11. Managers and staff are regularly involved in ES&H feedback and improvement activities.	E11.1 All AFRD supervisors (as identified by the Program Head/Project Leader) perform at least one walkthrough of selected AFRD spaces annually. E11.2 All AFRD personnel (except short-term) participate in QUEST activities.	E11.1 Supervisor walkthrough records maintained in Division office. E11.2 QUEST team rosters, assessment records/meeting notes maintained in Program Offices. Division Safety Committee meeting notes discussing QUEST activities.
E12. ES&H deficiencies identified from workspace inspections, self-assessment activities, and external appraisals are corrected in a timely manner. A downward trend of Level 1 and 2 LCATS repeat deficiencies is established.	E12.1 AFRD ES&H Administrator maintains LCATS database. E12.2 Assigned Taskmasters ensure LCATS are closed in a timely manner.	E12.1/12.2 LCATS database.
E13. Division performs thorough review of all staff injuries and accidents, including analysis of conditions that led to injury and implementation of corrective actions.	E13.1 Supervisors ensure accident causes and corrective actions are effectively identified on SAARs. E13.2 Corrective actions identified on SAARs are implemented.	E13.1 SAARs maintained in EH&S database. E13.2 Completion status of SAARs-related LCATS.

APPENDIX 3

AFRD QUEST PROGRAM GUIDE

Accelerator and Fusion Research Division
Ernest Orlando Lawrence Berkeley National Laboratory

HOW TO USE THIS GUIDE

Most of the pages of this Guide comprise forms and checklists to assist you in your **QUEST** activities. If you read Section 1 thoroughly, and, when needed, the short text at the beginning of each of the other sections describing the forms contained therein, you'll understand **QUEST**. All AFRD personnel are strongly encouraged to do this. For your use, here is a description of each of the sections of this Guide:

Section 1. **QUEST** Description

Please read this section carefully. It contains important information as to the basic requirements and flexibility given to Programs and Projects in setting-up **QUEST** teams and implementing **QUEST** activities.

Section 2. Team Roster

A current roster of Team members must be maintained in the Program or Project office. Establishing a team name and listing it as described in this section will help identify **QUEST** teams within your Program or Project.

Section 3. ES&H/QA Concerns

Any concern about employee safety and health, the protection of the environment, or conditions that affect the quality of AFRD activities should be listed as described in this section and handled in accordance with guidance contained in Sections 1 and 3.

Section 4. ES&H Checklists

This section contains model self-assessment checklists. Instructions for use are contained within the section. All AFRD space must be inspected at least once each year for applicable items on the **QUEST** Fundamentals checklist. The other checklists are provided as tools that assessment teams may use to assist in performing inspections. ES&H Coordinators and Team Leaders are encouraged to tailor the optional checklists to the hazards that may be found in your work areas.

Section 5. Quality Assurance/Quality Improvement

This section contains guidance for providing input on quality assurance issues to the AFRD QA Coordinator.

SECTION 1. QUEST DESCRIPTION

INTRODUCTION

QUEST is an integrated way to examine **QU**ality Assurance/Improvement and **E**nvironment, Safety, and Health through **S**elf-Assessment and **T**eamwork. Its basic premise is that teams composed of employees actually performing the work of the Programs are in the best position to evaluate the quality and safety of their workplace.

HISTORY

- **QUEST** was developed in 1994
- It was revised as QUEST-II in 1996.
- The April 1998 update aligned the **QUEST** program with the Lab Integrated Safety Management System by incorporating **QUEST** into the AFRD ES&H Management Plan.
- The October 1998 update provided greater flexibility to teams in deciding how to implement **QUEST**.
- The January 2000 update established an annual **QUEST** review as the required minimum level of **QUEST** participation and revised the Quality Assurance aspects of self-assessment.
- The 2001, 2002, and 2003 updates revised the **QUEST** Fundamentals checklist and the Quality Assurance section.
- AFRD management will review the **QUEST** program annually as part of our Integrated Safety Management Plan update.

OBJECTIVES

The main objective of **QUEST** is the identification and mitigation of any condition or process that jeopardizes the safety and health of employees, protection of the environment, or the quality of AFRD research or operations. The QUEST process involves all long-term AFRD personnel to raise awareness of ES&H and quality issues and develop the habit of identifying, reporting, and resolving potential problems before accidents or occurrences result. **QUEST** teams are also encouraged to identify opportunities for improvement, examine each of these opportunities, and implement those actions that they believe will lead to the improvement desired.

PROCESS

Required Activities:

All AFRD personnel (including Division employees, matrixed employees, visitors, temporary employees, students, and participating guests) are assigned to a QUEST self-assessment team, with the exception of short-term personnel (persons whose participation in AFRD work activities at LBNL are anticipated to occur over a period of less than 90 days/year). Persons whose participation in work activities at AFRD are anticipated to occur over a period of less than 90 days may be included in a QUEST team as determined by the Program Head. Composition of the teams is left to the discretion of the appropriate Program Head or Project Leader, but each team should have charge of self-assessment for the workspace of its members.

AFRD ALS Accelerator Physics Program personnel are assigned to ALS Division Safety Circles, which function as the ALS QUEST teams. They will participate in ALS Division QUEST activities, as directed by the ALS ES&H Coordinator. ALS may designate different requirements for AFRD's ALS Accelerator Physics personnel.

Program/Project ES&H Coordinators must coordinate team assignments to ensure the annual inspections cover all the Program/Project space at LBNL. Teams may work together or exchange areas.

Each QUEST team is required to perform an assessment of workplace ES&H hazards at least once each year. The Team Leader may select a subset of team members to perform the actual workplace inspection and report the findings to the team.

The applicable items on the QUEST Fundamentals checklist must be checked. (NOTE: ALS may designate different checklists for ALS assessments.) The optional checklists from Section 4 of this Guide are provided as tools teams may use when conducting inspections. Team members are also encouraged to identify quality assurance issues. The annual inspection should be completed before the end of the designated QUEST inspection month. The inspection may take place before the designated QUEST month to accommodate the work schedules of team members.

Each team must meet at least once each year to discuss the workplace inspection findings and solicit additional reports of concerns from its members. Teams must report any unresolved concerns to their Program/Project ES&H Coordinator.

The Program/Project ES&H Coordinator must report the unresolved concerns before or during the AFRD ES&H Operations Committee meeting immediately following the designated QUEST inspection month. The AFRD ES&H/QA Administrator will enter unresolved ES&H action

items into the Laboratory Corrective Action Tracking System (LCATS) database and track them to completion. QA action items will be forwarded to the AFRD QA Coordinator.

Program Heads and Project Leaders may establish additional requirements for QUEST activities within their Project or Program.

Recommended Activities:

In addition to the required annual inspection, QUEST teams are encouraged to remain active throughout the year. QUEST teams can play an important role in assisting personnel in identifying and solving problems. Team meetings are one way of providing feedback to the team on the actions that have been taken as a result of the concerns team members have identified. QUEST team meetings are also an opportunity to pass along relevant information from the AFRD ES&H committees. Some QUEST teams find value in meeting periodically throughout the year. Appropriate meeting topics include any issue affecting safety, the environment, or quality assurance. Teams are encouraged to choose topics that are "local issues" and fit their needs.

Teams may choose to perform additional assessments of particular areas or aspects of their work. If deficiencies are uncovered, corrections should be made immediately when practical. Section 4 or this guide includes an example of a form for recording all deficiencies found and corrections made. Items requiring the assistance of other LBNL organizations to correct, or for which additional guidance is needed should be promptly referred to the AFRD ES&H/QA Administrator through the Program/Project ES&H Coordinator.

TEAM STRUCTURE

Teams may comprise those with similar job descriptions, those who work in a given area, those who work together on specific projects, or any other selection criteria deemed appropriate by the Program/Project.

Each QUEST team must have a team leader. The team leader may be appointed by Program Head / Project Leader or elected by the team members. Although team leader rotation is not mandatory, AFRD strongly encourages election of the team leader by the team members for a fixed term. Frequent rotation of team leaders provides a slightly different direction to the team at each rotation and increases each employee's awareness of the many facets of quality assurance, ES&H, and self-assessment by giving them a leadership role for a short time.

Every team member is encouraged to attend all scheduled QUEST meetings. Each team member should have an active role to play in some facet of QUEST activities each year, e.g., writing a quality assurance policy or procedure, recording team activities, participating in self-assessment inspections, etc..

RECORDS

Each QUEST team will maintain a record of its activities including minutes and attendance rosters for all meetings, copies of inspection/correction lists, and a final report of actions taken or planned. The team leader will provide copies of these documents to the Program or Project ES&H Coordinator. As an agenda item on each AFRD ES&H Operations Committee meeting, items considered by the Program or Project to be significant will be discussed. Quality assurance issues will be forwarded to the AFRD QA Coordinator. Copies of all documents will be maintained in the Program or Project office to provide validation for our annual Division self-assessment report.

AFRD ES&H and QA COMMITTEES

AFRD ES&H Committees

Some Programs or major Projects have their own ES&H Committees, consisting of current **QUEST** team leaders, the Program or Project ES&H Coordinator, and others designated by the Program Head. Program ES&H Committees meet at the discretion of the AFRD Program Head or Project Leader. It is recommended that they meet at least once every two months. ES&H Committee meetings may be held in conjunction with another Program or Project meeting.

AFRD has a two-tiered ES&H Committee structure at the Division level -- the ES&H Operations Committee coordinates most ES&H program implementation activities, while the ES&H Committee provides oversight and direction. An Organization Chart of committee members is found in the Accountability section of the AFRD Integrated Safety Management Plan.

The AFRD ES&H Operations Committee consists of the Program and major Project ES&H Coordinators, the AFRD ES&H Administrator, and the AFRD ES&H Coordinator. This committee, working in conjunction with Program/Project ES&H Committees and QUEST teams, is the primary conduit for ES&H information both to and from LBNL and AFRD management. The EH&S Liaison is also invited to the meetings of this committee. Meetings are held monthly, usually on the first Friday of the month. At the meeting, Program/Project representatives discuss ES&H concerns and lessons learned from them. The AFRD ES&H Coordinator and/or Administrator pass on any information on lab-wide ES&H programs and problems that have arisen.

The AFRD ES&H Committee is chaired by the AFRD Director and consists of the AFRD Deputies, AFRD Program Heads and Project Leaders for major projects, AFRD Program and Project ES&H Coordinators, the AFRD ES&H Coordinator, and the AFRD ES&H Administrator. This committee usually meets 3-4 times each year to discuss ES&H problem areas and to suggest improvements to **QUEST**. The meeting normally takes place in conjunction with a regularly scheduled Program Heads meeting.

AFRD QA Coordinator

The Division Director selects the AFRD QA Coordinator. The AFRD QA Coordinator may, from time to time, request Program Heads/Project Leaders to designate QA representatives to serve on special committees to address particular QA concerns or quality improvement efforts. The results of these special committee efforts are reported to AFRD management for review and approval. The meeting will normally take place in conjunction with a regularly scheduled Program Heads meeting.

QUEST ROLE IN DIVISION SELF-ASSESSMENT

The Laboratory has implemented a self-assessment system that AFRD fully supports and in which the Division actively participates. This system includes the following assessments:

- Management Environment, Safety, and Health (MESH) assessments, conducted every three years by the senior research personnel on the Safety Review Committee, review how well the management systems described in our AFRD Integrated Safety Management Plan are functioning.
- Integrated Functional Appraisals (IFA), performed every three years by teams of EH&S Division specialists who make comprehensive inspections of AFRD operations based on identified risk levels.
- Division Self-Assessments, performed annually by each Division, measure the implementation of the Division Integrated Safety Management Plans.

QUEST is an important part of this system. Instead of waiting for an EH&S or Safety Review Committee self-assessment team to inspect our areas before we take action, we constantly assess the quality and safety of the locations where we work. After all, who is more familiar with our work and the hazards we face than we are? Assessment of Division spaces for day-to-day deficiencies (in both the ES&H and QA areas), and correction of these deficiencies, is accomplished by **QUEST** teams. Identifying and resolving easily correctable deficiencies within the Division permits Integrated Functional Appraisal teams to direct more of their attention to helping us improve our performance in less obvious areas. To avoid duplicated effort, the IFA teams review our **QUEST** action items as part of their appraisal and then focus their inspections on the more difficult to identify deficiencies.

The annual Division Self-Assessment report is compiled (by the AFRD ES&H Administrator) by reviewing **QUEST** documentation, findings from safety walkthroughs by Division and Program management, and other performance information such as accident reports, regulatory agency inspection reports, and findings of EH&S Division and Safety Review Committee assessments. Your **QUEST** findings help us identify ways of improving our ES&H/QA efforts. Our Division ES&H Self-Assessment Report is submitted to the Division Director and the Office of Assessment and Assurance. Findings and performance ratings of all the Division Self-Assessments are rolled up in an LBNL ES&H self-assessment report. The results are summarized for LBNL management in an ISM-Based Division Performance at a Glance Table.

LBNL PY 2003 ISM-Based Division Performance at a Glance

Validation Criteria for Performance Expectations	Rating
Resource allocation to address ES&H	satisfactory – green partial – yellow marginal - red
Strong ES&H communication	satisfactory – green partial – yellow marginal - red
Division workspace inspected	>85% - green >60% - <85% yellow <60% - red
Hazards identified and inventoried	satisfactory – green partial – yellow marginal - red
Engineering controls in place and maintained	satisfactory – green partial – yellow marginal - red
Administrative controls in place and maintained.	satisfactory – green partial – yellow marginal - red
Active ergonomic program	satisfactory – green partial – yellow marginal - red
SAA compliance	*regulatory driven* >90% green >75% - <90% yellow <75% red
Authorization (AHD, RWA, SSA) compliance	*regulatory driven* >90% - green >75% - 90% - yellow <75% - red
QA waste sample compliance	*regulatory driven* >95% or only 1 failure – green >92% - <95% - yellow <92% - red
Non-Compliance Acceptance Reports (NCARs)	*regulatory driven* 0 – green type 1 - yellow type 2 - red

Validation Criteria for Performance Expectations	Rating
Total Recordable Cases (TRC) of injuries and accidents	*contract driven* TRC >25% below 2.62 or 20% improvement or 1 case/yr. – green TRC <25% below/above 2.62 or 10% improvement or 2 cases/yr. – yellow TRC>25% above 2.62 - red
Lost Work Cases (LWC) of injuries and accidents	*contract driven* LWC >25% below 1.50 or 20% improvement or 1 case/yr. - green LWC < 25% below/above 1.50 or 10% improvement or 2 cases/yr. - yellow LWC >25% above 1.50 - red
Completion of Job Hazards Questionnaires (JHQs)	>85% green >60% - <85% yellow <60% - red
Completion of required courses	>85% green >60% - <85% yellow <60% - red
Demonstrated progress in waste minimization. Documented reviews of research or operations processes.	satisfactory – green partial – yellow marginal - red
Line management and staff participation in walkthroughs and other ES&H activities	satisfactory - green partial - yellow marginal - red
Completion of Level 1, 2, and 3 Laboratory Corrective Action Tracking System (LCATS) recorded deficiencies and self-assessment report opportunities for improvement	*contract driven* >90% green >80%- <90% yellow <80% - red
Division ensures accident causes and corrective actions are effectively identified on Supervisor's Accident Analysis Reports (SAARs) and implemented.	satisfactory - green partial - yellow marginal - red

SECTION 2. TEAM ROSTER

The current team rosters must be maintained in the Program or Project office.

The form on the following page can be used to list the members of your team and record their attendance at the two meetings required in each rotation period. As an alternative, Programs may develop equivalent forms.

While not a requirement, it is helpful for each of the teams that are the heart of the **QUEST** program to have an identity. If you wish, you may select a name for your team.

QUEST Team Roster

Program/Project:_____

Team Name (optional):_____

Team Leader:_____

Assessment Area(s):_____

Employee Name	**Employee ID #**

SECTION 3. ES&H/QA CONCERNS

One of the primary purposes of **QUEST** is to ensure that any concern you have about your safety or health, the health or safety of your co-workers, protection of the environment, or quality assurance in your work area is brought to the attention of management.

The forms that follows (or equivalent forms) are used by **QUEST** team members to submit concerns to their Team Leader.

The first form, the ES&H Concerns Report, is designed for use during **QUEST** inspections or by team members to report concerns noticed in the work place at any time.

The second form, the **QUEST** Meeting Report is designed for recording team meetings.

Prompt resolution of these issues will improve our safety, efficiency, and compliance with requirements. If a concern cannot be addressed without assistance from others, the Team Leader should immediately forward the concern to the Program or Project ES&H Coordinator or Quality Assurance Representative. At the end of each month, the reporting forms will be submitted to your Program or Project ES&H Coordinator for discussion at the next AFRD ES&H Operations Committee meeting. (If Quality concerns have been noted, they will be brought to the attention of the AFRD QA Coordinator.) All unresolved ES&H action items reported to the AFRD ES&H/QA Administrator will be tracked on LCATS, the Laboratory Corrective Action Tracking System.

We want to hear from you!

AFRD QUEST Team
ES&H/QA Concern Report

Please submit completed forms to Program/Project ES&H Coordinator

Date Found:_____
Name(s) of Finder(s)*:_____
Program/Project:_____

_____

Concern:

Location: Bldg:_____ Room and/or Area:_____

Description:
_____
_____
_____
_____
_____

Status:
___ Resolved (date)_____
___ Will be resolved by this team, or
___ Referred to ES&H Coordinator, or
___ Referred to QA Coordinator, or
___ Referred to _____

_____

Concern:

Location: Bldg:_____ Room and/or Area:_____

Description:
_____
_____
_____
_____
_____

Status:
___ Resolved (date)_____
___ Will be resolved by this team, or
___ Referred to ES&H Coordinator, or
___ Referred to QA Coordinator, or
___ Referred to _____

QUEST Meeting Report
Please submit copy of completed forms to Program/Project ES&H Coordinator

AFRD
QUality **E**S&H **S**elf-Assessment
Teamwork

Team Leader_____
Program/Project:_____
Date:_____

QA/ES&H Topic(s) of Discussion:

Items of ES&H/QA Concern:

1._____
_____
Resolved Immediately ☐ **or** (DATE)_____
Will be Resolved by this team ☐ **or**
Referred to ES&H Coordinator ☐ **or**
Referred to QA Coordinator ☐ **or**
☐ Referred to:_____

2._____
_____
Resolved Immediately ☐ **or** (DATE)_____
Will be Resolved by this team ☐ **or**
Referred to ES&H Coordinator ☐ **or**
Referred to QA Coordinator ☐ **or**
☐ Referred to:_____

3._____
_____
Resolved Immediately ☐ **or**
Will be Resolved by this team ☐ **or**
Referred to ES&H Coordinator ☐ **or**
Referred to QA Coordinator ☐ **or**
☐ Referred to:_____ **or**

Attendance (please print)

SECTION 4. ES&H CHECKLISTS

USING THE CHECKLISTS

The applicable items listed on the QUEST Fundamentals Checklist must be reviewed for all work areas at least once a year. This checklist covers items required to be checked by the LBNL Self-Assessment Performance Criteria.

Additional checklists are provided as optional tools. **QUEST** teams may use these checklists to help them identify safety concerns. These checklists are particularly useful to team members who are doing **QUEST** inspections for the first time.

The ES&H/QA Concerns Report form included in Section 3 of this Guide can be used to record any concerns involving checklist items.

QUEST FUNDAMENTALS SELF-ASSESSMENT CHECKLIST
REQUIRED

_____

REQUIRED FOR ALL LOCATIONS

MACHINE GUARDING AND SAFETY

Is a finger guard installed on tabletop paper cutter? _____

Are fan blades protected with a guard having openings no larger than 1/2 inch, when operating within 7 feet of the floor or working level?_____

SEISMIC AND GENERAL WORK ENVIRONMENT

Are bookcases, lockers, file cabinets, furniture, and equipment over three feet high secured against falling during an earthquake? Do storage cabinets and file cabinets have securely closing doors or drawers? _____

REQUIRED FOR LABS AND SHOPS

EMERGENCY EQUIPMENT

Are eye wash fountains and safety showers provided in areas where corrosive chemicals are handled?_____

Are eye wash fountains and safety showers readily accessible clearly marked, properly maintained, and inspected and tagged?_____

ENGINEERING CONTROLS AND SAFETY INSTRUMENTATION

Is preventive maintenance performed efficiently and within prescribed time limits? _____

Has the performance of each hood or local exhaust ventilation point been checked within the last 2 years as indicated by an EH&S inspection label on the hood? _____

Are radiation meters (including x-ray monitors and neutron detectors) installed where required? _____

Are fail-safe interlocks at radiation-generating devices tested for proper operation? _____

Are the doors to rooms containing Class IV lasers interlocked to prevent personnel from entering the room when the laser is in operation? Has the interlock been checked within the past 12 months? _____

MATERIAL HANDLING

Do employees always wear gloves and safety glasses or protective goggles while handling metal banding?_____
_

Are the Daily Inspection Tags for Hoist/Crane and Secondary Lifting Equipment completely filled out for each day of operation?_____

INDUSTRIAL TRUCKS (FORKLIFTS)

Are daily inspections of tires, lights, battery, fuel, steering, hydraulics, forks, brakes conducted? _____

Are forklift trucks tagged for maintenance when there is a malfunction?_____

PERSONAL PROTECTIVE EQUIP/CLOTHING

Are approved safety glasses, with side shields, required to be worn at all times in areas where there is a risk of eye injury?_____

Are protective gloves, aprons, shields or other means provided against cuts, corrosive liquids and chemicals? _____

Is personal protective equipment easily accessible, maintained in a sanitary condition, ready for use, and stored in an orderly manner?_____

Is appropriate foot protection required where there is risk of foot injuries from hot, corrosive, poisonous substances, falling objects, crushing or penetrating actions? _____

Are hard hats provided and worn where danger of falling objects exists? Are hard hats inspected periodically for damage to the shell and suspension system? _____

SHOPS ONLY

ABRASIVE WHEEL EQUIPMENT -- GRINDERS

Do abrasive wheel safety guards cover the spindle end, nut, and flange projections? _____

Is an adjustable work rest of rigid construction used to support the work of offhand grinding machines? Is the work rest kept adjusted closely to the wheel with a maximum clearance of 1/8 inch? _____

Is the adjustable tongue or end of the peripheral member at the top of the housing used and kept adjusted to within 1/4" of the wheel?_____

COMPRESSORS AND COMPRESSED AIR

Are safety glasses required in areas where air guns or nozzles are used?_____

When using compressed air for cleaning, do employees wear personal protective equipment and ensure that chip guarding is in place? _____

MACHINE GUARDING AND SAFETY

Are all pulleys, belts, gears, shafts, and moving parts that are within 7 feet of the floor or working level properly guarded? _____

Are machine guards secured and arranged so that they do not offer an accident hazard in themselves? _____

Are splash guards mounted on machines that use coolant to prevent the coolant from reaching employees? _____
Are switches, including foot-operated switches, guarded or arranged to prevent accidental actuation by personnel or falling objects?_____

Does machine guarding (e.g. barrier guards, two-hand tripping devices, electronic safety devices, etc.) protect employees in the machine area from hazards created by the point of operation, ingoing nip points, rotating parts, flying chips, and sparks? _____

PERSONAL PROTECTIVE EQUIP/CLOTHING

Are disposable dust masks being used only for nuisance dust materials? Is use of disposable dust masks evaluated by the Industrial Hygiene Group (to determine if masks provide sufficient protection)?_____

PORTABLE (POWER-OPERATED) TOOLS AND EQUIPMENT

Are circular saw guards checked to assure they are not wedged up, thus leaving the lower portion of the blade unguarded? _____

Are grinders, saws, and other power tools provided with appropriate safety guards?_____

WELDING, CUTTING, AND BRAZING

Are employees exposed to the hazards created by welding, cutting, or brazing operations protected with personal protective equipment and clothing? Is it required that eye protection, hand shields and goggles meet appropriate standards? _____

When the object to be welded cannot be moved and fire hazards cannot be removed, are shields used to confine heat, sparks, and slag?_____

GENERAL WORK ENVIRONMENT SELF-ASSESSMENT CHECKLIST
OPTIONAL-Recommended in all locations

_____

SIGNAGE AND POSTING

Are emergency telephone numbers posted where they can be readily found in case of emergency? _____

Space occupants must know the location of the assembly area(s) and evacuation route(s)._____

Are building and trailer identification numbers posted on exterior? Are room numbers readily visible?_____

Are hazard warning signs and tags used where there are immediate dangers or potential hazards? Are caution and information signs used where there are potential hazards or need for general instructions? Are obsolete signs promptly removed? _____

Are drains labeled with signs indicating that hazardous materials should not be poured down the drain? _____

Are signs concerning room capacities posted where appropriate?_____

Do exit signs contain the word "EXIT" in lettering at least 6 inches high, with the stroke of the lettering at least 3/4 inch wide? Are the signs and exits adequately illuminated?_____

ASBESTOS EXPOSURE

Are cement materials that contain asbestos (e.g., transite panels) in good condition?_____

Is asbestos-containing thermal insulation on plumbing equipment, steam pipes, etc. in good condition (i.e., all exposed surfaces, including ends, are sealed)? **NOTE: Report punctures and deteriorating insulation to the Industrial Hygiene Group** _____

ELEVATED SURFACES

Are all elevated surfaces (beneath which people or machinery could be exposed to falling objects) provided with standard 4-inch toe boards?_____

Is a permanent means of access and egress provided to elevated storage and work surfaces? _____

Is material on elevated surfaces piled, stacked or racked in a manner to prevent it from tipping, falling, collapsing, rolling or spreading? _____

Are signs posted, when appropriate, showing the elevated surface load capacity? Are loads on elevated surfaces within posted load capacity? _____

ENERGY CONSERVATION

Are there loose windows, non-closing doors, holes in outside walls, and other building deficiencies, which result in excess use of energy?_____

Is inefficient use of energy caused by heating large areas when spot heating would be sufficient, lighting unoccupied areas, etc., avoided? _____

Where space heating is inadequate, have all work areas (fixed and occupied) been provided with spot heating? _____

FLOOR AND WALL OPENINGS

Are all floor holes into which persons can accidentally walk guarded either by a standard railing with a standard toe board on all exposed sides or by a floor hole cover that is hinged in place? _____

Are floor and stairway openings guarded by a cover, a guardrail, or equivalent on all sides (except at entrance to stairways or ladders)? _____

Are toe boards installed around the edges of permanent floor openings where persons may pass below the opening?_____

Is every open-sided floor or platform 4 feet or more above the adjacent floor or ground level guarded by a standard railing on all open sides except where there is an entrance to a ramp, stairway, or fixed ladder? _____

LADDERS

Are all ladders maintained in good condition, joints between steps and side rails tight, all hardware and fittings securely attached and movable parts operating freely without binding or undue play? _____

Are ladder rungs and steps free of grease and oil and are non-slip safety feet provided on each ladder? _____

Are only approved ladders or step stools in use? _____

Is it required that the base of portable rung or cleat type ladders be placed so that slipping will not occur? If conditions do not permit proper placement, is the ladder lashed or otherwise held in place?_____

Are portable metal ladders legibly marked with signs reading "CAUTION - Do Not Use Around Electrical Equipment" or equivalent wording? _____

LEAD EXPOSURE

If painted lead objects (excluding material used for shielding) are present in the work place, has the Industrial Hygiene Unit evaluated the airborne lead levels? _____

LIFTING/LOADING

Are tote box loads less than 50 lbs.? Are heavily loaded tote boxes labeled to indicate excess weight?_____

MATERIAL HANDLING

Are Material Safety Data Sheets available to employees who handle or may be exposed to hazardous substances? _____

Are materials stored above 6 feet in height secured or contained so that individual articles cannot fall? _____

Are storage racks internally braced and secured to prevent tipping? _____

OCCUPATIONAL NOISE

Has the Industrial Hygiene Unit been contacted to arrange for noise monitoring if background noise makes it impossible to conduct a normal conversation without shouting? _____

SEISMIC AND GENERAL WORK ENVIRONMENT

Are adequate labels present to prevent food or beverages from being stored in laboratory and shop refrigerators or cabinets used for chemical storage? _____

Are all worksites, restrooms, and washrooms clean and orderly and in a sanitary condition?_____

Are ceiling panels, overhead light fixtures, and other overhead objects properly secured? Are wall bulletin boards, chalk boards, framed pictures, and window blinds properly secured?_____

In areas where means of egress could be blocked, are books and other heavy objects prevented from falling off high shelves (lips on bookcase shelves or bungee cords)?_____

Is storage of heavy items on shelves, tops of bookcases or tops of file cabinets above 3 feet avoided? _____

Are standard stair rails or handrails on all stairways having four or more risers?_____

Are steps on stairs and stairways designed or provided with a surface that renders them slip resistant? _____

Where stairs or stairways exit directly into any area where vehicles may be operated, are adequate barriers and warnings provided to prevent employees stepping into the path of traffic? _____

Are aisles and passageways kept clear and free of tripping hazards? _____

Are wet surfaces covered with non-slip materials? _____

OFFICE SELF-ASSESSMENT CHECKLIST
OPTIONAL-Supplement for all offices

ASBESTOS EXPOSURE

Are floor tiles in good condition, and not being abraded or scraped as a result of work practices (floor buffing, scraping chairs, machinery vibration, etc.)? _____

WASTE DISCHARGES

Are drains labeled with signs indicating that hazardous materials should not be poured down the drain? _____

WORKSTATION ERGONOMICS

Is the worker comfortable while using the workstation?

If no, an ergonomic evaluation should be requested. Below are examples of some possible questions to use in discussing workstations with workers:

- Are the worker's feet flat on the floor or supported by a footrest?
- Are workstations adjustable and arranged to minimize excessive twisting, bending, reaching and pulling?
- Do workers take rest breaks at regular intervals as appropriate to the intensity of the tasks?
- Does the location of the keyboard allow the worker's forearms to be parallel to the floor (i.e., at right angles to the spine), and the wrists straight, in line with the forearm?
- Have position adjustments wrist rest and/or mouse pad rest been considered if the worker's wrists are resting on a hard or sharp surface?
- Is adequate space available for workstation hardware (e.g., VDT monitor, keyboard, mouse/trackball, document holder, wrist rest)?
- Is adequate space available under the work surface/table so that the legs, knees and thighs do not rub or hit the work surface, or items stored underneath?
- Is the chair adjustable and does it provide proper lower back support?
- Is the VDT monitor positioned to avoid glare (e.g. from overhead lights or window light)?
- To minimize neck and shoulder strain, is the top of the VDT display screen at or slightly below the worker's eye level; and is the VDT monitor located directly in front of and 18-24 inches from the worker?

LAB AND SHOP SELF-ASSESSMENT CHECKLIST
OPTIONAL- Supplement for all shops and labs

_____

AIR PERMITS

If an operation, process, or equipment emits either nonradiological substances (toxic or organic) or radionuclides into the air, or if any of the following has changed in the past year or is expected to change in coming year:
1) source location,
2) total hours of operation,
3) type of material processed,
4) quantity of material processed annually,
5) addition of an air emissions abatement device,
has EH&S been notified to determine regulatory compliance requirements? _____

CHEMICAL LABELING AND STORAGE

Are all chemical containers labeled as to their contents and hazard? _____

Are chemicals stored in approved containers with, if necessary, secondary containment? Are containers with flammable or toxic chemicals tightly closed and covered when not in use?_____

Are incompatible chemicals stored separately? _____

CHEMICAL SAFETY

Are overhead chemical storage units equipped with seismic guards (such as toe boards, bungee cords, or shelf lips)?_____

CHEMICAL SPILL RESPONSE

Are spill kits readily accessible?_____

Are hazardous liquids such as solvents stored and dispensed where they cannot accidentally spill into drains (floor or sink)? _____

COMPRESSED GAS CYLINDERS -- STORAGE AND HANDLING

Are compressed gas cylinders stored in areas, which are:
1) protected from heat sources such as flame impingement, intense radiant heat, electric arcs, or high temperature lines;
2) away from stairs, elevators, and gangways; and
3) protected from cryogenic spills (by platforms or barriers)? _____

Are cylinders legibly marked to clearly identify the type of gas contained? _____

Are cylinders stored away from stairs, elevators, and gangways in a vertical, valve-end up position to prevent them creating a hazard by tipping, falling, or rolling. Are they secured with at least 2 chains or other devices fastened to a wall rack or other substantial structure?_____

Do compressed gas cylinders have appropriate pressure relief devices? _____

Are fuel-gas cylinders placed with valve end up whenever in use; and liquefied gases stored with the valve end up? _____

EMERGENCY PREPAREDNESS

Are shut-off valves marked and easily accessible? Are tools readily available to turn off natural gas shut-off valves? _____

IDENTIFICATION OF PIPING SYSTEMS

Is tubing or piping material appropriate for the type of material it contains, e.g., no copper for acetylene gas? _____

Are pipelines carrying hazardous substances identified by tags; are the tags constructed of durable materials, the message carried clearly and permanently distinguishable; and are tags installed at each valve or outlet?_____

LOCKOUT/TAGOUT PROCEDURES

Are lockout tags affixed properly to all defective equipment not otherwise secured against use?_____

RADIATION PROTECTION

Are all furniture and/or equipment items (including gas cylinders) going from designated Radiological Material Areas to reclamation (salvage) surveyed for radiation and tagged "RELEASE" by EH&S?_____

SEISMIC AND GENERAL WORK ENVIRONMENT

Is equipment capable of causing hazard if knocked over properly secured? Are wheeled equipment or carts provided with wheel-locks or other method to secure against rolling away?_____

SIGNS AND POSTING

Are warning signs posted where employees, other than qualified employees, might come in contact with live parts? _____

Are "Eye Hazard Areas" marked? _____

Are signs concerning exposures to x-ray, microwave, or other harmful radiation or substances posted where appropriate? _____

Are laser warning signs in place, both on the laser and at entrances to the controlled area?_____

SUSPECT/COUNTERFEIT PARTS

Are certified high-strength fasteners installed in critical applications marked or identifiable? Are copies of the certification papers available on site? _____

Are suspect parts being removed, packaged, labeled, delivered to Warehouse 903, and documented following the instructions in the Office of Assessment and Assurance Suspect/Counterfeit Parts Report form? _____

Have all suspect parts (including high strength fasteners and circuit breakers) been removed from parts stocks? _____

Is the use of suspect high-strength fasteners in critical applications avoided? If not removed immediately, have they been marked (use red if colored marking) or are they identifiable to indicate that they are to be removed as soon as possible? _____

SHOPS ONLY

ABRASIVE WHEEL EQUIPMENT -- GRINDERS

Are machines designed for a fixed location securely anchored to prevent movement, or designed in such a manner that in normal operation they will not move?_____

COMPRESSORS AND COMPRESSED AIR

Are employees prohibited from using compressed air at greater than 30 psi for cleaning purposes? _____

ELECTRICAL

Is restart protection provided in the control device of motors driving machines or equipment, which could cause probable injury from inadvertent starting after a power loss? _____

HAND TOOLS AND EQUIPMENT

Are all tools and equipment (company, lab, or employee-owned) used by employees at their work place in good condition? Are portable electrical tools and equipment grounded or of the double insulated type or provided with barriers or shields? Are electrical appliances such as vacuum cleaners, polishers, vending machines, etc., grounded?_____

LEAD EXPOSURE

If lead-containing materials are melted (via soldering, casting, etc.) during work procedures, has the Industrial Hygiene Group evaluated the airborne lead levels? _____

MACHINE GUARDING AND SAFETY

Are all emergency stop buttons colored red?_____

Are all pulleys, belts, gears, shafts, and moving parts that are within 7 feet of the floor or working level Are power and operating control switches within easy reach of the operator while at the regular work position (no need to reach over cutter to make adjustments)? _____

Do arbors and mandrels have firm and secure bearings and are they free from play? _____

Is sufficient clearance provided around and between machines to allow for safe operations, set up and servicing, material handling and waste removal?_____

On each machine operated by electric motors, is there a positive means to render the controls or devices inoperative (e.g. lockout power) for maintenance, repair, or security? _____

SOLVENT-BASED CLEANING OPERATIONS

Is solvent (including waste solvent) stored or disposed of in a manner that will avoid evaporation (i.e., sealed containers) into the air? Is the solvent-based cleaning system cover in place, except when processing work or performing maintenance? _____

WELDING, CUTTING, AND BRAZING

Are cables inspected for wear and damage, and exposed bare conductors replaced when needed?_____

Are only approved apparatus (torches, regulators, pressure-reducing valves, acetylene generators, manifolds) used? Are oxygen-acetylene systems equipped with the proper check valves and flashback protectors? _____

Is red used to identify the acetylene (and other fuel-gas) hose, green for oxygen hose, and black for inert gas and air hose?_____

Is suitable (i.e., dry chemical) fire extinguishing equipment available for immediate use? _____

When arc welding is to be suspended for any substantial period of time, such as during lunch or over night, are all electrodes removed from the holders and the holders carefully located so that accidental contact cannot occur, and is the machine disconnected from the power source? _____

HOIST/CRANE/FORKLIFT SELF-ASSESSMENT CHECKLIST
OPTIONAL- Supplement for material handling areas

HOISTS/CRANES AND SECONDARY EQUIPMENT

Are lifting cables labeled?_____

Are the controls of hoists plainly marked to indicate the direction of travel or motion? _____

Is each pendant cable tagged with an LBNL "Warning to Avoid Injury" tag? _____

Is there an LBNL Proof Load Tag on the Hoist? Does the load limit on the tag match the marking on the hoist? Is the rated load of each hoist legibly marked and visible to the operator?_____

INDUSTRIAL TRUCKS (FORKLIFTS)

Are keys removed from the ignition when the lift truck is unattended? _____

Are load capacities and centers of gravity (24" from mast) observed?_____

Are the brakes on each industrial truck capable of bringing the vehicle to a complete and safe stop at any time? _____

Does each industrial truck have a warning horn or other device which can be clearly heard above the normal noise in the areas where operated? _____

Is the speed limit for industrial trucks appropriate for load and road conditions?_____

When ascending or descending a grade 10% or more, are loads carried/transported upgrade?_____

When forklift trucks are left unattended, are the forks lowered, controls neutralized, hand brake set, and wheels chocked if on a ramp or incline? _____

Will the industrial truck's parking brake effectively prevent the vehicle from moving when unattended? _____

MATERIAL HANDLING

When hoisting material or equipment, are provisions made to assure that no one will be passing under the suspended loads?_____

SECTION 5. QUALITY ASSURANCE and QUALITY IMPROVEMENT

LBNL Requirements

It is LBNL's policy to carry out all our activities that contribute to the scientific and operational objectives of the Laboratory safely, reliably, and in accordance with sound quality assurance and conduct of operations principles. Berkeley Lab organizations must:

- Describe their organizations structure, functional responsibilities, levels or authority, and interfaces;
- Plan for their functions and activities to deliver safe, reliable, and quality products and services; and
- Hire and retain staff proficient to perform their functions and activities.

The basic implementing elements and guidelines of LBNL's QA system are found in Chapter 8 of the Regulations and Procedures Manual. The Office of Assessment and Assurance (OAA) is tasked with maintaining and improving the quality of laboratory activities. In order to accomplish this, they developed the lab's Operating and Assurance Program Plan (OAP), which can be found on the web at: **http://www.lbl.gov/ehs/oap/oap_home.htm**. The OAP describes the elements necessary to integrate quality assurance, safety management, and conduct of operations requirements into operations.

Each Program or Project has the opportunity to devise it's own methods of addressing the basic documentation requirements described in the OAP. Many of the requirements are already met by LBNL or General Sciences documents. Programs and Projects only need to develop documentation for procedures that are unique to their operations. Documents may be kept in Program/Project files, control rooms, desktop notebooks, or electronically. Facility and Function Notebooks are not required. The Program Head or Project Leader should maintain records of what the essential documents are and where they are kept.

The Office of Assessment and Assurance suggests the following discussion questions for QUEST teams that wish to assess and improve their QA systems.

QA SELF-ASSESSMENT DISCUSSION QUESTIONS - *OPTIONAL*

Organization

1. Is there a well-defined organizational structure for the program/group? Are functional responsibilities, levels of authority, and work interfaces well defined and understood by staff?
2. In planning the program and work activities, are safety, reliability, and quality addressed?
3. Are all staff proficient to perform their functions and activities?

Process Management

1. Is there evidence of clear communication to staff of goals, objectives, and procedures for the work process or program activity?
2. Are there identifiable process controls that enhance performance, quality, and safety?
3. Does the work group maintain reports, documents, and records to ensure the availability of accurate information/results of the program/project?
4. Is there an authorization mechanism, either formal or informal, that signifies that the required procedures, controls, and resources are in place to conduct the work?

Assessments and Improvements

1. Does the group conduct its own management assessments?
2. Are periodic assessments (i.e., QUEST and others) being performed?
3. Are deficiencies related to reliability, quality and safety identified and tracked for corrective actions?